Evaluation of Mechanical Debris Systems for the Removal of Naturally Incoming Debris at the Tracy Fish Collection Facility, Tracy, California

Investigators

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Summary

The U.S. Department of the Interior, Bureau of Reclamation (Reclamation) has operated a fish collection facility in Tracy, California, the Tracy Fish Collection Facility (TFCF), since the 1950s. To support the fish salvage operations at TFCF, Reclamation has developed an interdisciplinary research program aimed at improving operations at the existing TFCF, and for developing a possible Tracy Fish Test Facility (TFTF) at the site. Research studies aim to improve fish guidance, fish removal, and/or reintroduction of salvaged fish into Sacramento and San Joaquin Rivers. Within the TFCF, the effect of debris load on salvage operations can be detrimental. Various types of debris are of concern as they affect louver guidance, and fish removal and subsequent salvage.

Past debris studies (Tracy Report, Fish Facility Studies, California, Volume 33; *Water Born Debris Removal Evaluations Using a Traveling Screen at the Tracy Fish Collection Facility, Tracy, California*) have demonstrated that a mechanical screen can be of benefit in removing this incoming debris from within TFCF. A traveling mechanical screen was found that it could be used to remove debris in front of the fish guidance louvers. The results presented in that report demonstrated the effectiveness of

the traveling screen, especially during routine cleaning operations and when debris coming into the facility is heavy.

For this study, improvements to the debris collection system, or travelling mechanical screen, were installed. In addition, the facility's water screen system was implemented. Also, improvements in the debris transport method from the screen to the debris hauling truck were made. Experiments were completed in FY 2005, with data analyses completed in FY 2009.

Problem Statement

Within the TFCF, the effect of debris load on salvage operations can be detrimental. Various types of debris are of concern as they affect louver guidance, and fish removal and subsequent salvage. Results from this study could be used to decrease effects of debris on salvaged fish.

Goals and Hypotheses

Goals:

1. Determine if there is a benefit to operations (*i.e.*, successful salvage vs. efficiency) derived from operating the mechanical screens.

Hypotheses:

1. Is there a significant difference between the proportions of debris accumulating in TFCF with the screen systems on, than with the screen systems off?

Materials and Methods

Debris studies were conducted the latter portion of 2004 and 2005 using the modified debris screens to remove naturally incoming debris in the TFCF, specifically at the louvers and in the holding tanks. Data were analyzed in 2009 using SigmaStat 3.5 (Jandel Scientific, San Rafeal, Califronia) to determine what percentage of debris was removed at various locations in the secondary channel. This proposal is to ensure completion of Volume 43 report for the Tracy Series.

Coordination and Collaboration

This report will be written collaboratively by Denver Bureau of Reclamation Fisheries and Wildlife Resource Group and TFCF staff.

Endangered Species Concerns

None.

Dissemination of Results (Deliverables and Outcomes)

The primary deliverable will be Volume 43 in the Tracy Series.